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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/725,236

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Andrew J. Curello

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EXAMINER

ROGERS, DAVID A

ART UNIT

PAPER NUMBER

2856

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/725,236

Applicant(s)

CURELLO ET AL.

Examiner

David A. Rogers

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment Filed 28 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 28-47 and 53-60 is/are pending in the application.
- 4a) Of the above claim(s) 3-11, 37, 38, 41, 42, 44 and 45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 28-36, 39, 40, 43, 46, 47 and 53-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 28 September 2005 have been thoroughly considered, but are not convincing.

The applicant argues that there is no teaching or suggestion to provide a sensor having a nonmoving portion (a second location) on the fuel cell or on the electronic equipment. This is not correct. Both the fuel supply of Becerra *et al.* and the ink supply of Hsu *et al.* can be disposable items. One of ordinary skill would clearly recognize that, by decreasing the number of parts one could decrease the overall manufacturing costs associated with the disposable items. This decreased cost for manufacturing can result in decreased costs to the consumer or increased profitability for the manufacturer. Furthermore, there is no change in functionality when the nonmoving portion is move from the fuel/ink supply to the fuel cell or the electronic equipment. That is the level sensor still operates to determine the amount of fluid remaining independent of the placement of the nonmoving portion.

The applicant then states that Becerra *et al.* teaches the use of a "simple and accurate fuel gauge in the form of an observable window. Because of this the applicant argues that there is no support for adding a sensing device to the fuel supply of Becerra *et al.* In response, just because Becerra *et al.* envisions a simple device is not sufficient to eliminate any or all other sensors that might be added to determine fuel level. More specifically, Becerra *et al.*'s use of a

visual indicator does not teach away from being replaced with a fuel level sensor. In fact, the level sensor of Hsu *et al.* is also simple and accurate. If fact, it is probably more accurate than the system shown in Becerra *et al.* Finally, as noted in the previous office action the indicator of Becerra *et al.* may not be viewable for all applications as it could housed within the electronic device. Therefore, the level sensor of Hsu *et al.* would allow the electronic device itself to display the amount of fuel remaining without having to remove the fuel supply.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 28-31, 36, 39, 40, 43, 46, 47, 53-55, and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent Application Publication 2003/0129464 to Becerra *et al.* in view of United States Patent 6,641,240 to Hsu *et al.*

Becerra *et al.* teaches several different embodiments of fuel containers (reference items 202, 302, 502a, 502b, 602, and 702) for cooperation with fuel cells (reference item 3) for electronic devices. The fuel containers shown include a spring/plate combination (figures 2, 5A, 5B, and 7) and a foam/plate

combination (figure 3). Becerra *et al.* teaches that it is desirable to know the fuel volume remaining in the fuel container (see figure 6). Becerra *et al.* does not teach a fuel gauge having a moving member and a static member.

Hsu *et al.* teaches a container (reference item 100) having a bladder (reference item 115). Attached to the container and bladder is a capacitive sensor (reference item 210, 710) having a moving plate member (reference item 210a, 710a) and a static plate member (reference item 210b, 710b). As the bladder expands, i.e., as the liquid in the tank is depleted, the movable plate approaches the static plate. The change in capacitance is monitored via a detecting circuit (reference item 250, 750) and is related to the amount of liquid remaining in the container.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Becerra *et al.* with the teachings of Hsu *et al.* in order to provide a gauge for determining the amount of fuel remaining in a fuel container.

In Becerra *et al.* the visual ascertainment of the fuel level, as seen in figure 6, may not always be practical since the fuel container may be enclosed within the electronic device, or the fuel itself may be clear and not easily viewable through a slot. Therefore, it would be obvious to determine the fuel remaining and display it via some other means, such as the display of the electronic device (phone, camera, computer, etc.). Hsu *et al.* teaches that for enclosed containers with bags a sensor can be used to measure the amount of

remaining liquid. Hsu *et al.* teaches that this device produces an accurate measurement of the amount of liquid remaining.

With regard to the location of the nonmoving portion it would be well within the scope of one of ordinary skill to provide the nonmoving portion on the fuel cell or on the electronic equipment. Both the fuel supply of Becerra *et al.* and the ink supply of Hsu *et al.* can be disposable items. One of ordinary skill would clearly recognize that, by decreasing the number of parts one could decrease the overall manufacturing costs associated with the disposable items. This decreased cost for manufacturing can result in decreased costs to the consumer or increased profitability for the manufacturer. Finally, there is no change in functionality when the nonmoving portion is move from the fuel/ink supply to the fuel cell or the electronic equipment. That is the level sensor still operates to determine the amount of fluid remaining independent of the placement of the nonmoving portion.

With regard to claims 28, 29, and 47 the location of the electrical circuit does not change the functionality of the sensors. Having the circuit located in an electronic device would allow the fuel supply (which can be disposable) to be manufactured with few parts thus decreasing its manufacturing costs. Locating the circuit in the fuel supply is obvious and would allow the fuel supply to be used with a plurality of different electronic devices since Becerra *et al.* teaches fuel cells for portable electronic equipment such as cell phones and laptops (handheld and portable).

With regard to claims 39, 40, and 46 Hsu *et al.* teaches a movable member adjacent to, i.e., on, the bladder. In combination with Becerra *et al.* the movable member would also be on the bladder of the fuel container, which is a fuel supply.

With regard to claim 43 Hsu *et al.* teaches a static member on the vessel. In combination with Becerra *et al.* the static member would be on the fuel cell or in the electronic equipment such that it can detect the movable member.

4. Claims 32-35 and 56-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becerra *et al.* in view of Hsu *et al.* as applied to claim 1 and 36 above, and further in view of United States Patent Application Publication 2003/0006245 to Rodgers, and United States Patent 5,816,224 to Welsh *et al.*

Becerra *et al.* in view of Hsu *et al.* provides a gauge for determining the amount of fuel remaining in a fuel container in which a capacitive sensor is used as the gauge. Becerra *et al.* in view of Hsu *et al.* does not teach the use of an oscillating magnetic field sensor (Hall sensor) for determining the remaining fuel.

Rodgers teaches a device (reference item 10) having an outer vessel (reference item 12) with a liquid (reference item 14) and a float (reference item 16). The float has a second liquid (reference item 18) and a sensed member (reference item 24). The sensed member is taught as being a magnet. The outer vessel further comprises a sensor (reference item 26) in the form of a Hall effect sensor. As seen in figure 1 the magnet moves up and down in response

to the amount of second liquid in the float. The Hall effect sensor is static.

Rodgers teaches that “[t]he amount of fluid contained in the inner vessel [float] is determined based upon the weight or buoyancy of the inner vessel within the outer vessel. The apparatus utilizes a sensing mechanism to determine the weight of the vessel.” See column 1, lines 10-15. From Welsh *et al.* it is taught that a float (reference item 112) moves in response to the amount of liquid in a body (reference item 110). It is also taught that capacitance sensors, Hall effect sensors, or even optical sensors are interchangeable. See Welsh *et al.*, at column 17, lines 15-24.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Becerra *et al.* in view of Hsu *et al.* with the teachings of Rodgers and Welsh *et al.* to provide a Hall effect sensor to determine the amount of remaining fuel in a fuel container as part of a fuel cell.

From Hsu *et al.* it is known to use a capacitive sensor to determine the amount of remaining liquid. From Rodgers it is known to use a Hall effect sensor and magnet that move relative to each other in order to determine an amount of fluid in a vessel. From Welsh *et al.* it is known that capacitive sensors and Hall effect sensors are interchangeable. The magnet (reference item 24) of Rodgers would replace the movable plate (reference item 210a) of Hsu *et al.* The Hall effect sensor (reference item 26) of Rodgers would replace the static plate member (reference item 210b) of Hsu *et al.*

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

United States Patent 4,447,743 to Bean et al. teaches a magnetic float (reference item 12) in a vessel (reference item 10). The float moves in response to the amount of fluid (reference item 14) in the vessel. An oscillating sensor is utilized to detect the position of the float in the fluid.

United States Patent 5,859,365 to Kataoka et al. teaches a bladder (reference item 5) containing fuel (reference item F). As seen in figure 9 there is a rest switch (reference item 63). The reset switch can be a magnetic proximity switch comprising a magnet and a sensor. The sensor can be a Hall sensor or a magnetic coil.

United States Patent Application Publication 2005/0014041 to Becerra et al. teaches that it is known to provide sensors in or in communication with the fuel supply for a fuel cell.

Toshiba : Press Releases of 05 March, 2003 teaches electronic equipment having internal fuel cells. This press release also teaches that the electronic equipment will “include interface and electric circuits to assure efficient control of power supply; sensors to monitor methanol concentration and liquid level; and a remaining quantity sensor to tell users when they need to change the methanol fuel cartridge.”


6. During a phone conversation with the applicant's representative on 18 August 2005 it was mutually agreed that the finality of the previous office action was premature and would be withdrawn. However, as the applicant's arguments submitted in response to that office action are not persuasive, **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Rogers whose telephone number is (571) 272-2205. The examiner can normally be reached on Monday - Friday (0730 - 1600).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dar

16 November 2005


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